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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,325	10/15/2004	Tsutomu Yoshitake	Q84259	9221

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
LEWIS, BEN	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,325	YOSHITAKE ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/26/08*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *33 and 35-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *33 and 35-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. The Applicant's remarks filed on February 4th, 2007 was received.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on October 10th, 2007).

Claim Rejections - 35 USC § 103

3. Claims 33-40 and 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida et al. (U.S. Patent No. 6,057,051) in view of Johnson (U.S. Patent No. 6,808,833 B2).

With respect to claims 33 and 42, Uchida et al. disclose a miniaturized fuel cell assembly (title).

With respect to a heat-producing section and a heat-dissipating section arranged adjacent to the heat producing section, Uchida et al. teach that the hydrogen storage unit **205** "fuel supply section" is heated by the air discharged from the fuel cell body **204** "power generating section" (Col 8 lines 24-30).

With respect to a fuel supply section Uchida et al. teach that the cell device **2** includes a cell device casing **3** constituting a shell of the cell device **2**. Mounted within the cell device casing **3** are a fuel cell body **4**, a hydrogen storage unit **5** storing hydrogen to be used in the fuel cell body **4**, hydrogen supply means **6a** for feeding the hydrogen from the hydrogen storage unit **5** to the fuel cell body (Col 5 lines 54-67).

With respect to a fuel supply section being arranged in the heat-dissipating section Uchinda et al. teach that since the hydrogen supply pipes **6b** are embedded in the water retention means **8** "heat-dissipating section" as described above, the moisture or water in the water retention means **8** penetrates into the hydrogen supply pipes **6b** through peripheral walls thereof, thereby humidifying the hydrogen gas flowing through the interior of these pipes **6b**. The water retention means 8 is held in contact with the fuel cell body **4**, and therefore absorbs heat produced when the fuel cell body **4** generates electricity, thus contributing to evaporation of the retained moisture. Besides, the water retention means **8** "heat-dissipating section" is extended to be held in contact with the hydrogen storage unit **5**, and therefore transfers the heat, produced when the fuel cell body **4** generates electricity, to the hydrogen storage unit **5** to heat a hydrogen storing alloy, thereby enhancing an efficiency of a hydrogen-discharging reaction (Col 6 lines 1-67) (See FIGS. 6 and 7).

With respect to a flow-rate-control section, Uchida et al. teach that the fuel cell device comprises a control unit for controlling a flow of the hydrogen from the hydrogen storage unit to control an operation of a fuel cell in the fuel cell body (Col 3 lines 4-15).

With respect to the fuel-supply section comprises a fuel tank and fuel channel and wherein at east part of the fuel channel is arranged in the heat-dissipating section Uchinda et al. teach that since the hydrogen supply pipes **6b** are embedded in the water retention means **8** "heat-dissipating section" as described above, the moisture or water in the water retention means **8** penetrates into the hydrogen supply pipes **6b** through peripheral walls thereof, thereby humidifying the hydrogen gas flowing through the

interior of these pipes **6b**. The water retention means 8 is held in contact with the fuel cell body **4**, and therefore absorbs heat produced when the fuel cell body **4** generates electricity, thus contributing to evaporation of the retained moisture. Besides, the water retention means **8** "heat-dissipating section" is extended to be held in contact with the hydrogen storage unit **5**, and therefore transfers the heat, produced when the fuel cell body **4** generates electricity, to the hydrogen storage unit **5** to heat a hydrogen storing alloy, thereby enhancing an efficiency of a hydrogen-discharging reaction (Col 6 lines 1-67) (See FIGS. 6 and 7).

Uchida et al. does not specifically teach the fuel being a liquid. However, Johnson discloses a fuel supply for a fuel cell (title) wherein the fuel container **24** is configured to hold a liquid fuel supply, such as a borohydride or methanol solution, and is typically constructed from a material inert to the fuel solution. Fuel supply **20** also includes a fuel outlet **28** configured to pass fuel out of fuel storage area **26** (Col 2 lines 45-60). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the liquid fuel system of Johnson into the fuel cell system of Uchida et al because Johnson teach that these fuels "liquid" are relatively safe and easy to use and to store at room temperature, they may be used in disposable or rechargeable fuel supplies (Col 1 lines 55-64).

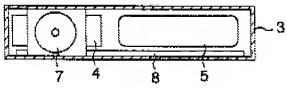
Uchida et al. as modified by Johnson are considered analogous art because they are from the similar problem solving area of supplying fuel to a fuel cell powered laptop computer which is common to both Uchida et a. and Johnson.

Furthermore, direct methanol "liquid" and hydrogen "gaseous" based fuel cells are widely known in the art. The use of liquid and gaseous fuels in portable electronic applications are also widely known in the art as shown by the teachings of both Uchida et al. and Johnson et al. which disclose the use of hydrogen and liquid fuel being used in laptop applications respectively. Therefore it would have been obvious at the time the invention was made to incorporate the liquid fuel of Johnson et al in the fuel cell of Uchida et al. because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp, in this case, it is the use of liquid "methanol" as opposed to gaseous "hydrogen" fuel. Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)).

With respect to claim 35, Uchinda et al. teach that the hydrogen storage unit **205** is heated by the air discharged from the fuel cell body **204** while there can be used a construction, in which heat generated from the equipment "heat-producing section", on which the fuel cell power source is mounted, is transferred to the unit by the use of a high thermally-conductive metal such as copper or aluminum or carbon materials in order to achieve similar effects (Col 8 lines 24-45).

With respect to claim 36, the fuel tank and the fuel cell body **4** are stacked above heat-dissipating section **8** in the device casing **3** "which contains the heat producing section" in figure 6.

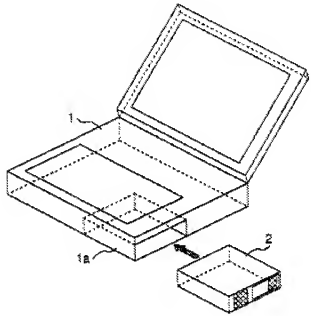
FIG.6



With respect to claims 37 and 43-45 , Uchinda et al. the fuel cell device comprises a control unit for controlling a flow of the hydrogen from the hydrogen storage unit to control an operation of a fuel cell in the fuel cell body (Col 3 lines 4-15).

With respect to claims 38-39, Uchinda et al. the fuel cell device **2** "power generating section" is detachably received in a cell device-receiving portion Ia of an equipment **1** "heat producing section", such as a personal computer and the like, for which a cell power source is required (Col 5 lines 54-67) (See Fig. 1).

FIG.1



With respect to claim 40, Uchinda et al. teach that the polymer electrolyte fuel cell uses ion exchange membranes, which are a solid polymer electrolyte, as an electrolyte, and a general construction thereof is shown in FIG. 29. In this construction employing the ion exchange membranes **51**, a positive electrode **52** and a negative electrode **53** are formed respectively on both sides of the membrane **51** to provide a layer construction, thus forming a unit cell **54**. When hydrogen is used as fuel, the following reaction occurs in an interface of contact between a catalyst and the polymer electrolyte at the negative electrode (Col 5 lines 20-35). Uchinda et al. the fuel cell device **2** "power generating section" is detachably received in a cell device-receiving

portion Ia of an equipment **1** "heat producing section", such as a personal computer and the like, for which a cell power source is required (Col 5 lines 54-67) (See Fig. 1).

With respect to claim 41, Uchida et al. as modified by Johnson disclose a miniaturized fuel cell assembly in paragraph 2 above.

With respect to a fuel supply section being arranged in the heat-dissipating section, Uchida et al. teach that since the hydrogen supply pipes **6b** are embedded in the water retention means **8** "heat-dissipating section" as described above, the moisture or water in the water retention means **8** penetrates into the hydrogen supply pipes **6b** through peripheral walls thereof, thereby humidifying the hydrogen gas flowing through the interior of these pipes **6b**. The water retention means 8 is held in contact with the fuel cell body **4**, and therefore absorbs heat produced when the fuel cell body **4** generates electricity, thus contributing to evaporation of the retained moisture. Besides, the water retention means **8** "heat-dissipating section" is extended to be held in contact with the hydrogen storage unit **5**, and therefore transfers the heat, produced when the fuel cell body **4** generates electricity, to the hydrogen storage unit **5** to heat a hydrogen storing alloy, thereby enhancing an efficiency of a hydrogen-discharging reaction (Col 6 lines 1-67) (See FIGS. 6 and 7).

With respect to cooling the heat producing section with a liquid fuel supplied to the fuel-supply section, Uchida et al. teach that the hydrogen storage unit **205** "fuel supply section" is heated by the air discharged from the fuel cell body **204** "heat producing section" while there can be used a construction, in which heat generated

from the equipment "heat-producing section", on which the fuel cell power source is mounted, is transferred to the unit by the use of a high thermally-conductive metal such as copper or aluminum or carbon materials in order to achieve similar effects (Col 8 lines 24-45). "The heat producing section of Uchinda et al. is cooled by the fuel of Uchinda et al. through a thermally conductive material."

Response to Arguments

4. Applicant's arguments filed on April 28th, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) The fuel cell according to the present invention has a fuel supply portion and a power generating section, both of which are mechanically separable from each other, as illustrated in Figs. 2-4 of the present specification. Both the fuel supply portion and the power generating section of the fuel cell are not packaged with in any casing. This separate structure of the fuel cell makes it possible to individually arrange the fuel supply portion and the power generating section in the vicinity of different, remote, portions of an electric device, such as a heat dissipating section in the heat producing section of the electric device. Accordingly, Applicants respectfully submit that the

presently claimed invention is not rendered obvious by the combined teachings of Uchida and Johnson.

(b) The position set forth in the Office Action at page 10 is that Uchida and Johnson do constitute analogous art because both are directed toward fuel cells. However, Applicants respectfully assert that Uchida and Johnson constitute nonanalogous art because of the types of fuel utilized by the fuel ceils with which the references are concerned. Uchida is directed toward the art concerning fuel cells utilizing hydrogen fuel, which is not liquid at room temperature. Johnson, on the other hand, is directed toward the art concerning fuel cells utilizing fuel that is liquid at room temperature. See, e.g., page 9 of the Amendment of January 30, 2007. Accordingly, Applicants respectfully submit that Uchida and Johnson constitute nonanalogous art.

(c) Applicants respectfully submit that neither Uchida nor Johnson disclose or teach cooling a heat producing section using the fuel itself. Uchida does not disclose that the hydrogen fuel therein cools the heat producing section of the fuel cell. Uchida teaches that the hydrogen storage unit 205 (the fuel supply section) is heated by the air discharged from the fuel cell body and water retention means 8 for recovering and retaining water formed in the fuel cell body 4 (see column 6, lines 3-4 of Uchida). In addition, the hydrogen supply pipes 6b are embedded in the water retention means 8. The moisture or water in the water retention means 8 penetrates into the hydrogen

supply pipes 6b through peripheral walls thereof, thereby humidifying the hydrogen gas flowing through the interior of these pipes 6b (see column 6, lines 44-49 of Uchida). The water retention means 8 is held in contact with the fuel cell body 4, and therefore absorbs heat produced when fuel cell body 4 generates electricity, thus contributing to evaporation of the retained moisture (column 6, lines 49 to 52). Thus, in Uchida the water retention means 8 retains water formed in the fuel cell body 4 and the water penetrates into the hydrogen supply pipes 6b. Accordingly, Applicants note that the water may serve to cool the fuel cell body 4. However, the hydrogen fuel itself is not used to cool or dissipate the heat generated by any other heat producing section of the fuel cell.

(d) In addition, as discussed on pages 9-10 of the Amendment of January 30, 2007, the combined teachings of Uchida and Johnson would not lead one of ordinary skill in the art to arrive at Applicants' claimed invention because (1) Johnson, which discloses a fuel cell fuel storage unit for storing fuel that is liquid at room temperature, provides no teaching or motivation for altering the fuel cell taught within Uchida such that the fuel cell would run on fuel that is liquid at room temperature, rather than on hydrogen; and (2) one of ordinary skill in the art would use a fuel storage unit with Uchida that stores hydrogen, since that is the fuel that Uchida uses - not a fuel storage unit such as the one disclosed in Johnson that stores fuel that is incompatible with the disclosed fuel cell. In response, the position set forth in the Office Action merely asserts that such a combination would be "obvious" in light of Johnson's apparently irrelevant

disclosure that the use of liquid fuels in fuel cells is safe. Applicants respectfully submit that the response set forth in the Office Action did not fully address Applicants' arguments, and Applicant respectfully requests the Examiner's position with respect to the above arguments.

(e) As discussed on pages 10-12 of the Amendment of January 30, 2007, there is insufficient motivation to alter the fuel cell in Uchida to use fuel that is liquid at room temperature, and therefore there is no motivation to alter the teachings of Uchida such that the fuel storage unit disclosed within Johnson could even be considered for use with the fuel cell in Uchida. In addition, Applicants again respectfully submit that in the presence of the specific teaching of hydrogen fuel and in the absence of any indication that the fuel cell structure taught within Uchida is compatible with a fuel that is liquid at room temperature, that there is insufficient motivation to alter the fuel cell in Uchida to use the fuel required by the present claims. Further, Applicants again respectfully submit that there has not been provided any motivation regarding why one of ordinary skill in the art would attach to a fuel cell a fuel storage unit meant to store fuel that is not the same type of fuel used by the fuel cell. The response to Applicants' argument in this respect was that that Johnson discloses that liquid fuels are "relatively safe and easy to use and to store at room temperature." Applicant respectfully submits that this is not sufficient motivation to alter the fuel cell in Uchida, and even if it were, that such a vague teaching would not indicate to one of ordinary skill in the art that there was a reasonable probability of success for using a fuel that is liquid at room temperature in

a fuel cell that is explicitly disclosed as using hydrogen fuel. Nor would such a teaching indicate to one of ordinary skill in the art how such an alteration could be made.

(f) Applicants respectfully submit that the concept of cooling the heat-producing section by contact with the fuel channel is limited to a fuel cell which uses liquid fuel. In other words, separating the fuel-supply section of the fuel cell from its power-generating section and connecting both of the above-mentioned sections using the fuel channel make sense only in the fuel cell which uses liquid fuel. In contrast, one would not envision the concept of cooling the heat-producing section using the fuel channel from a fuel cell which uses the hydrogen fuel, as disclosed in Uchida. Further, the present invention has an advantage in that the fuel channel may be located at the heat-producing section, providing a degree of freedom in connection with a layout of the fuel tank (the fuel supply section) and the power-generating section of the fuel cell. With this structure, it is possible to increase the durability of the fuel tank because the temperature of the fuel tank is kept at about room temperature. Moreover, the power-generating section of the fuel cell can be supplied with the liquid fuel which has been heated by the heat producing section, promoting a chemical reaction in the power-generating section of the fuel cell. Thus, the structure according to the present invention is effective in generating large quantities of electric power.

In response to Applicant's arguments, please consider the following comments.

(a) Applicant is reminded that limitations of the specification cannot be read into the claims. Applicant has not claimed "a fuel supply portion and a power generating section, both of which are mechanically separable from each other."

(b) In response to applicant's argument that Uchida and Johnson are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Uchida as modified by Johnson are considered analogous art because they are from the similar problem solving area of supplying fuel to a fuel cell powered laptop computer which is common to both prior art references.

(c) and (f) Uchinda et al. teach that the hydrogen storage unit **205** is heated by the air discharged from the fuel cell body **204** while there can be used a construction, in which heat generated from the equipment "heat-producing section", on which the fuel cell power source is mounted, is transferred to the unit by the use of a high thermally-conductive metal such as copper or aluminum or carbon materials in order to achieve similar effects (Col 8 lines 24-45). Examiner notes that Uchinda et al. teaches

two embodiments of heating of the hydrogen storage unit 1) By using air discharged from the fuel cell and 2) By using a conductive metal to transfer heat from the equipment (heat producing section) of Uchinda et al. to the hydrogen storage unit of Uchinda et al. It is noted that examiner is relying on embodiment #2 as taught by Uchinda et al. and was presented in the previous office action.

(d) and (e) Uchida et al. does not specifically teach the fuel being a liquid. However, Johnson discloses a fuel supply for a fuel cell (title) wherein the fuel container **24** is configured to hold a liquid fuel supply, such as a borohydride or methanol solution, and is typically constructed from a material inert to the fuel solution. Fuel supply **20** also includes a fuel outlet **28** configured to pass fuel out of fuel storage area **26** (Col 2 lines 45-60). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the liquid fuel system of Johnson into the fuel cell system of Uchida et al because Johnson teach that these fuels "liquid" are relatively safe and easy to use and to store at room temperature, they may be used in disposable or rechargeable fuel supplies (Col 1 lines 55-64).

Uchida et al. as modified by Johnson are considered analogous art because they are from the similar problem solving area of supplying fuel to a fuel cell powered laptop computer which is common to both Uchida et al. and Johnson.

Furthermore, direct methanol "liquid" and hydrogen "gaseous" based fuel cells are widely known in the art. The use of liquid and gaseous fuels in portable electronic applications are also widely known in the art as shown by the teachings of both Uchida

et al. and Johnson et al. which disclose the use of hydrogen and liquid fuel being used in laptop applications respectively. Therefore it would have been obvious at the time the invention was made to incorporate the liquid fuel of Johnson et al in the fuel cell of Uchida et al. because a person of ordinary skill has good reason to pursue the known options within his or her technical grasp, in this case, it is the use of liquid "methanol" as opposed to gaseous "hydrogen" fuel. Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)).

Conclusion

5. **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ben Lewis/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795